BioREaCH:Biodiversity-Remote sensing for Estuarine and Coastal Habitat research

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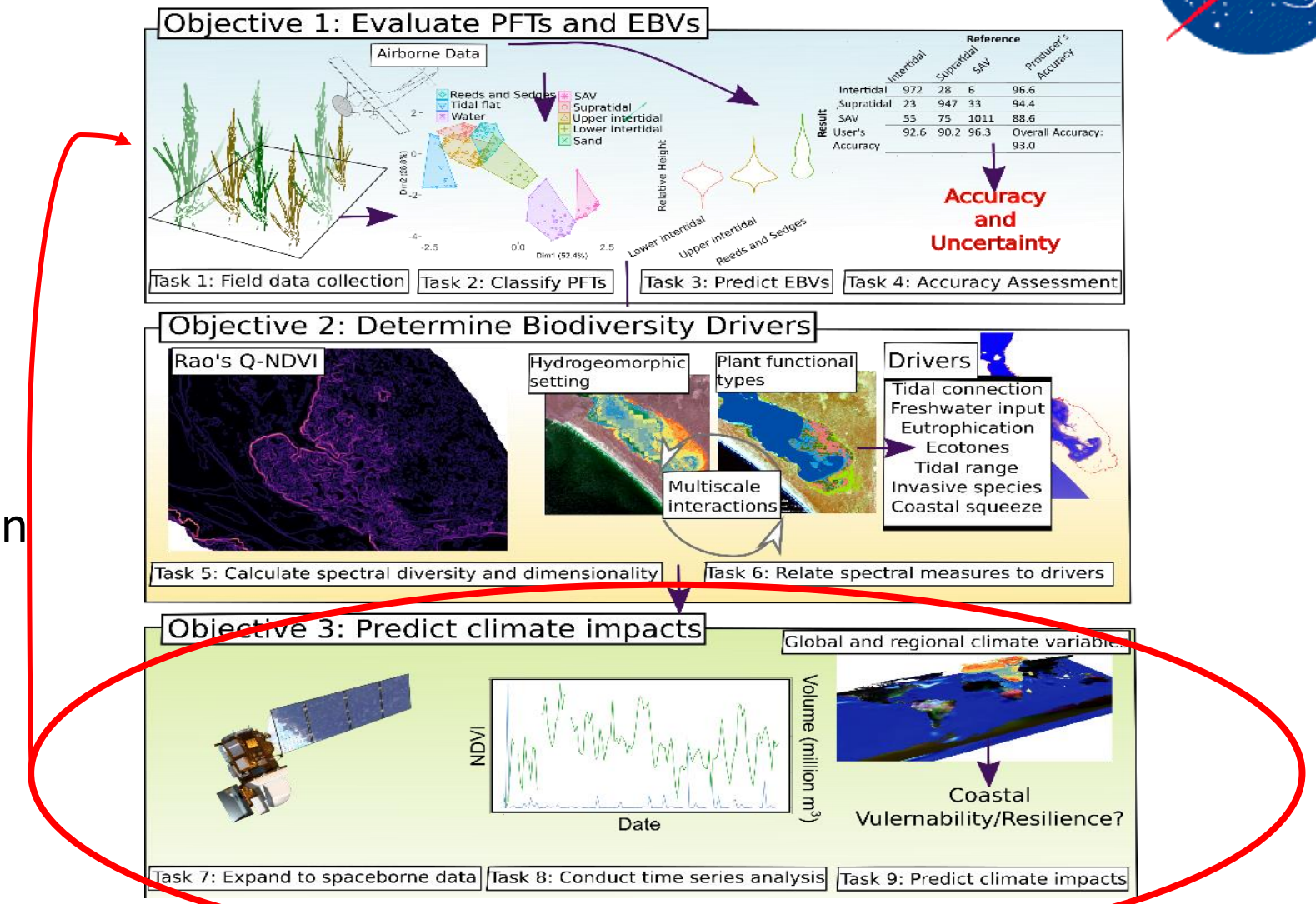
Project goals

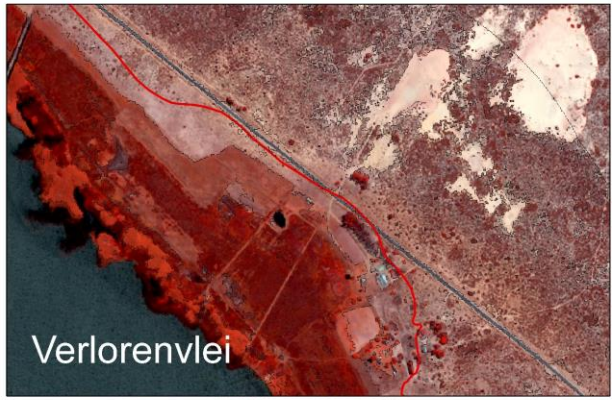
- We propose to evaluate the drivers of biodiversity across the land ocean aquatic continuum with state-of-the-art remote sensing, and investigate the potential impacts of climate change on coastal biodiversity
  - 1.EBVs vary significantly between climates (cool and warm temperate), and terrestrial elevation is a secondary control.
  - 2.Estuarine biodiversity trends are driven by a combination of major drivers, including tidal connections and landscape disturbance, freshwater inputs, and ecotones.
  - 3.Estuaries with greater PFT diversity will demonstrate greater climate resilience.

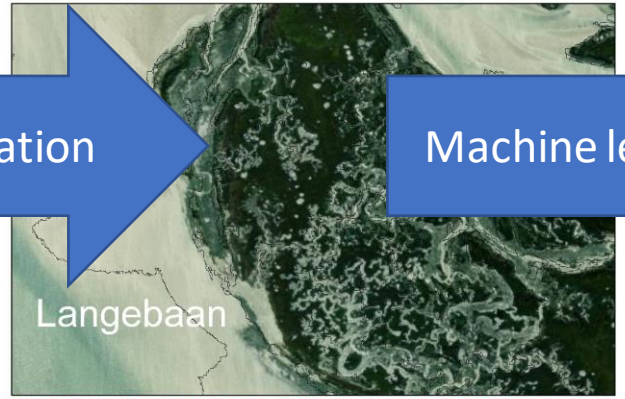
Starting backwards

- This presentation will focus on objective 3
  - Change analysis
  - Elevation/tides relative to PFTs
  - Spectral resolution



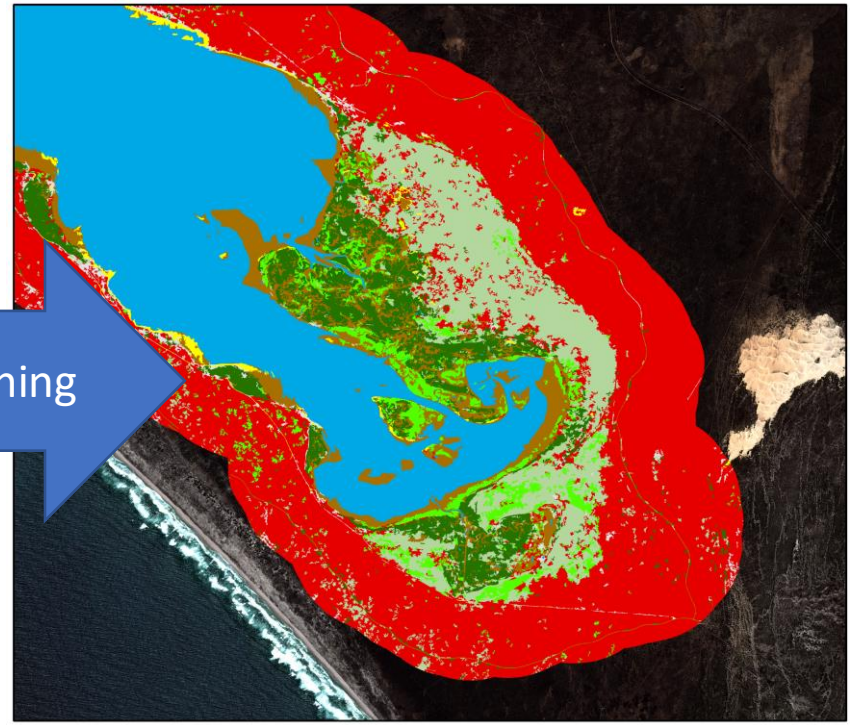
Study Sites - simplified workflow



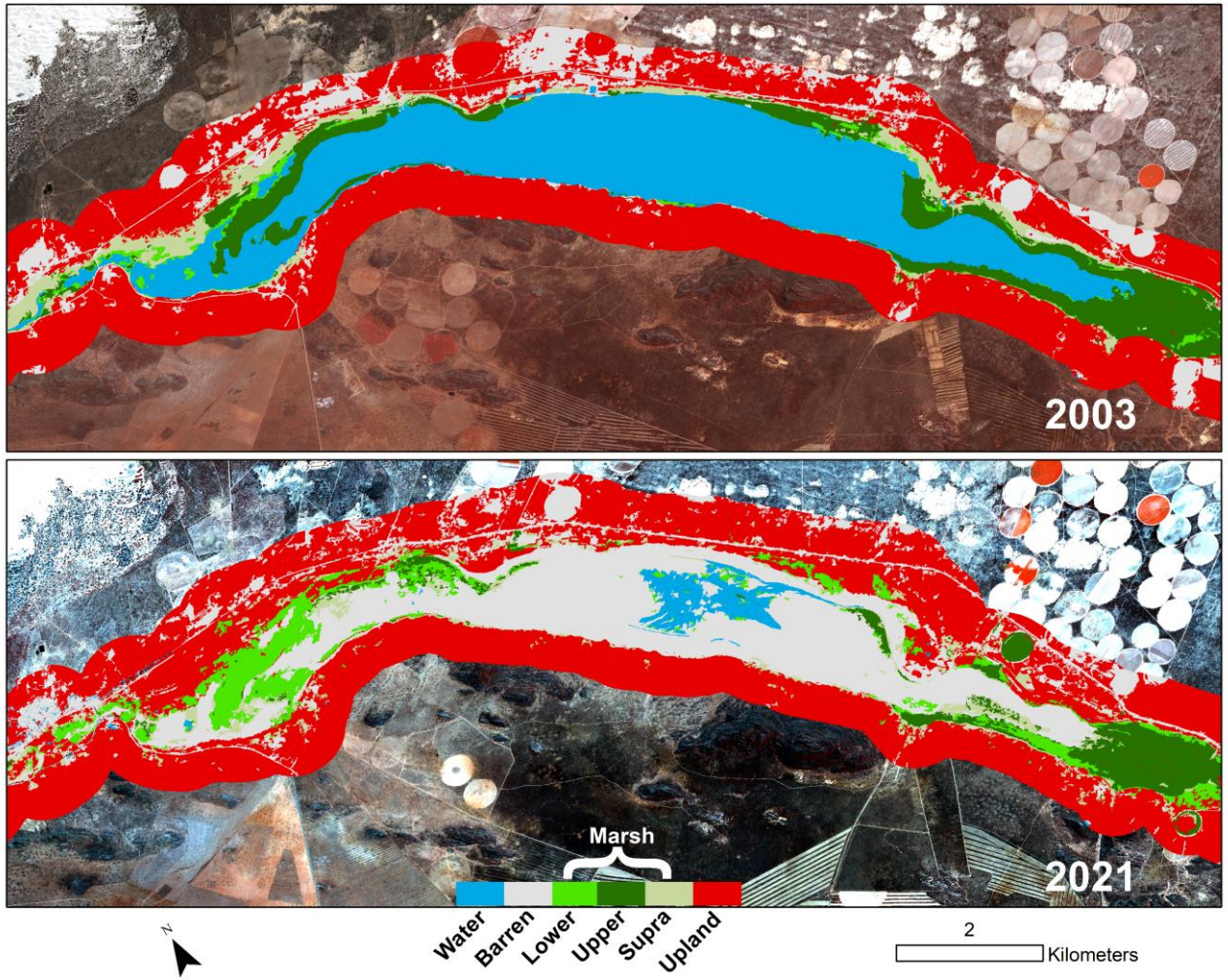


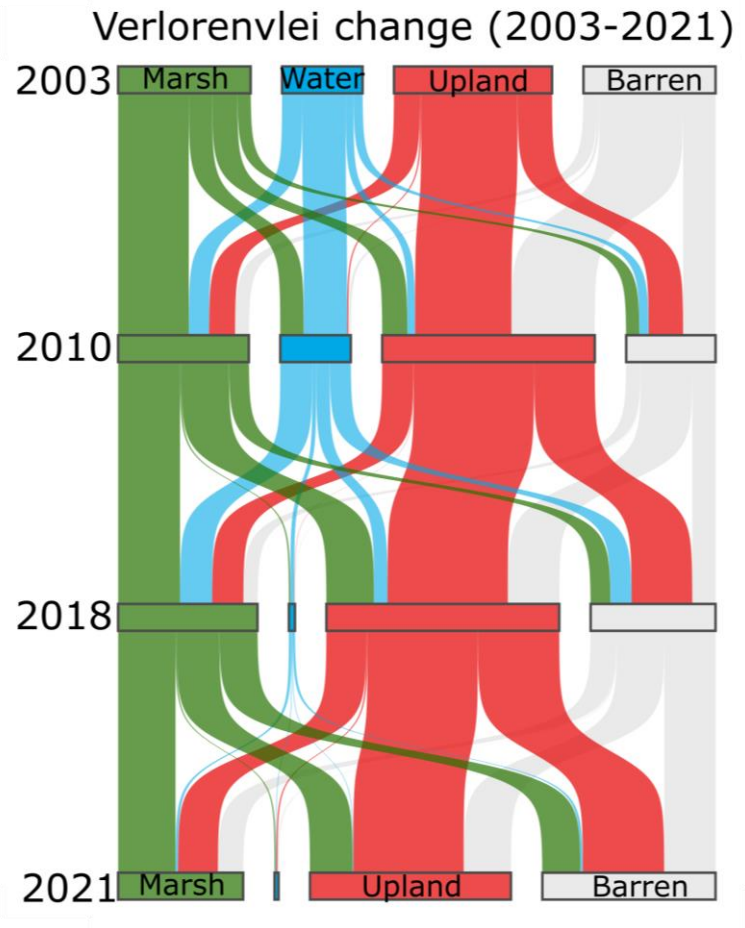
Segmentation

Machine learning

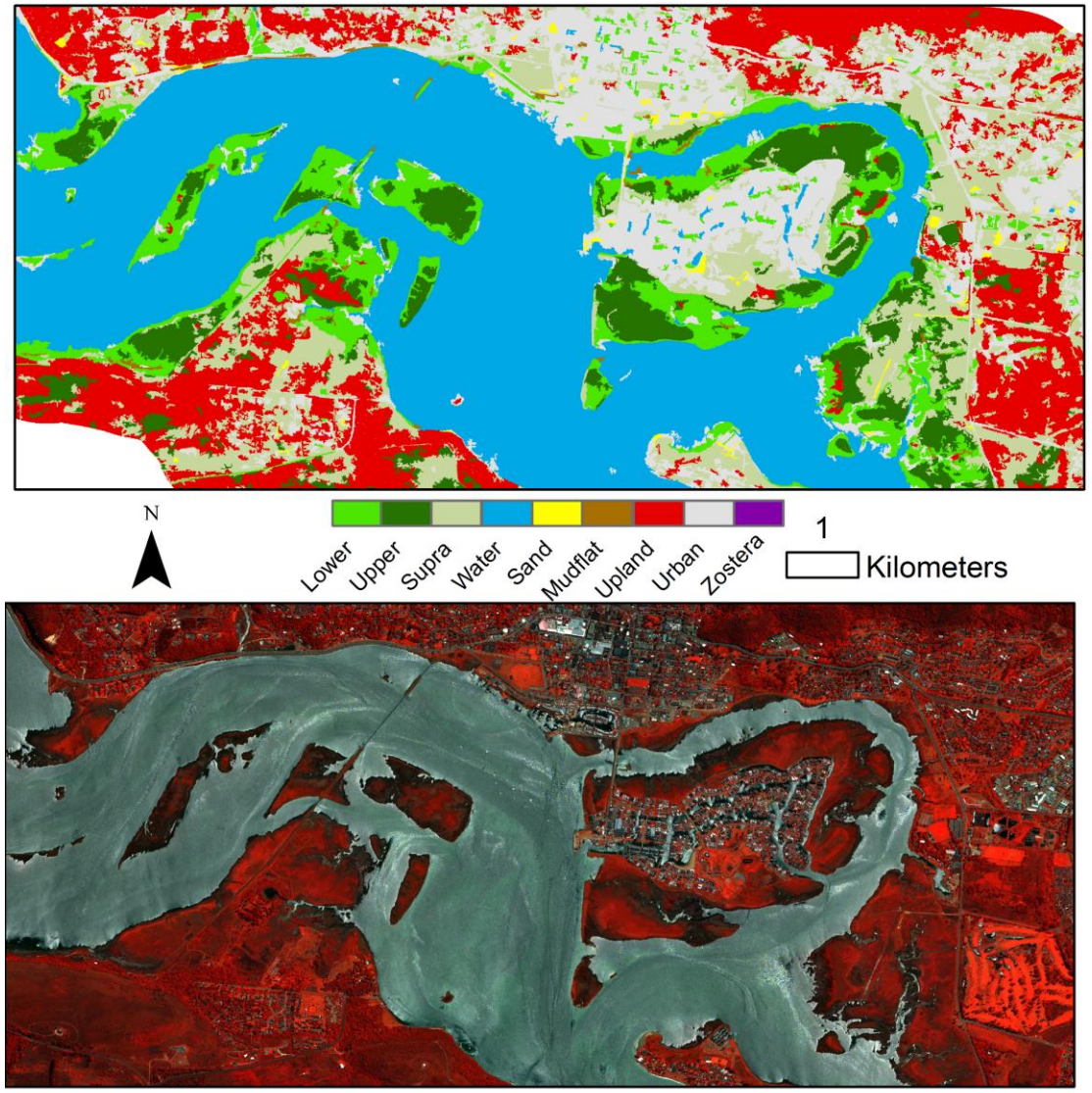


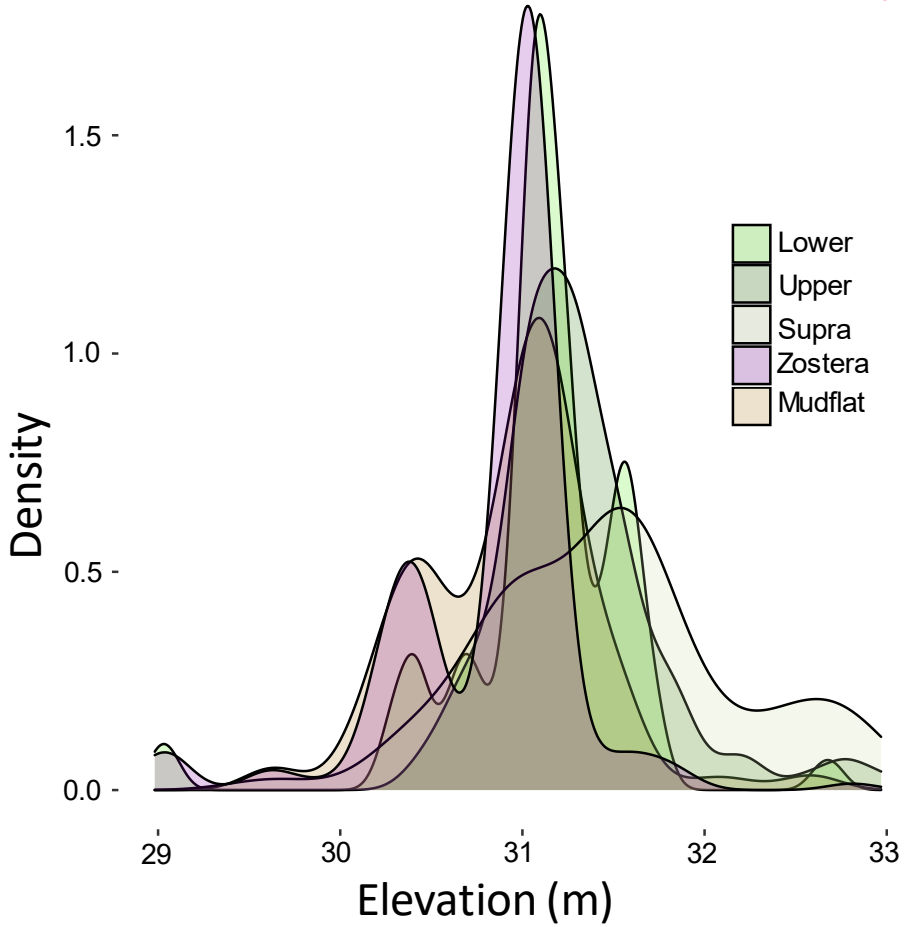
Change analysis : Verlorenvlei





Classification and tides





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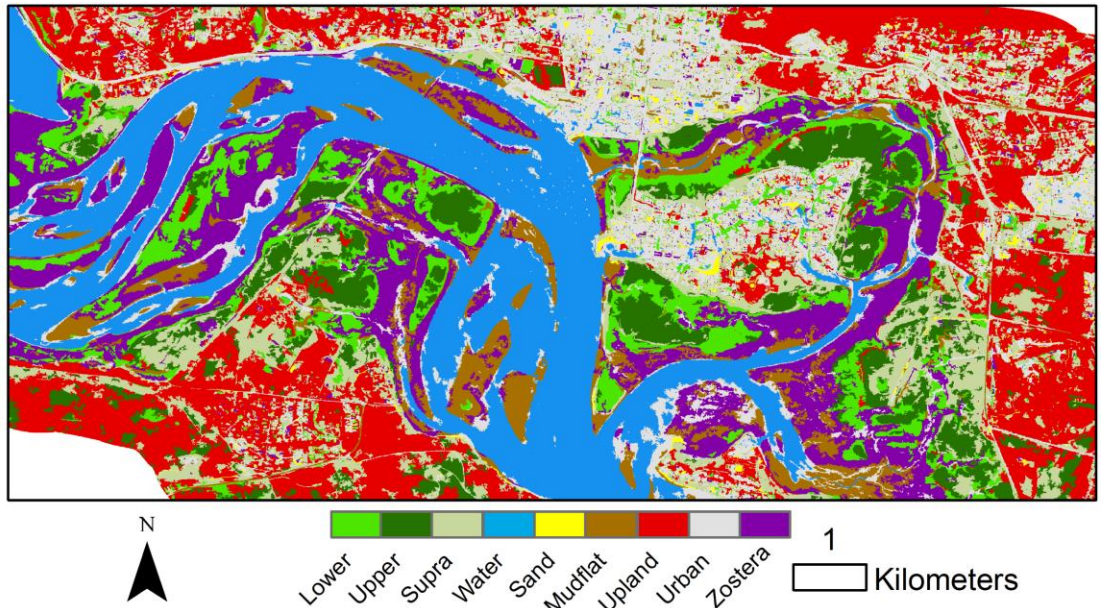
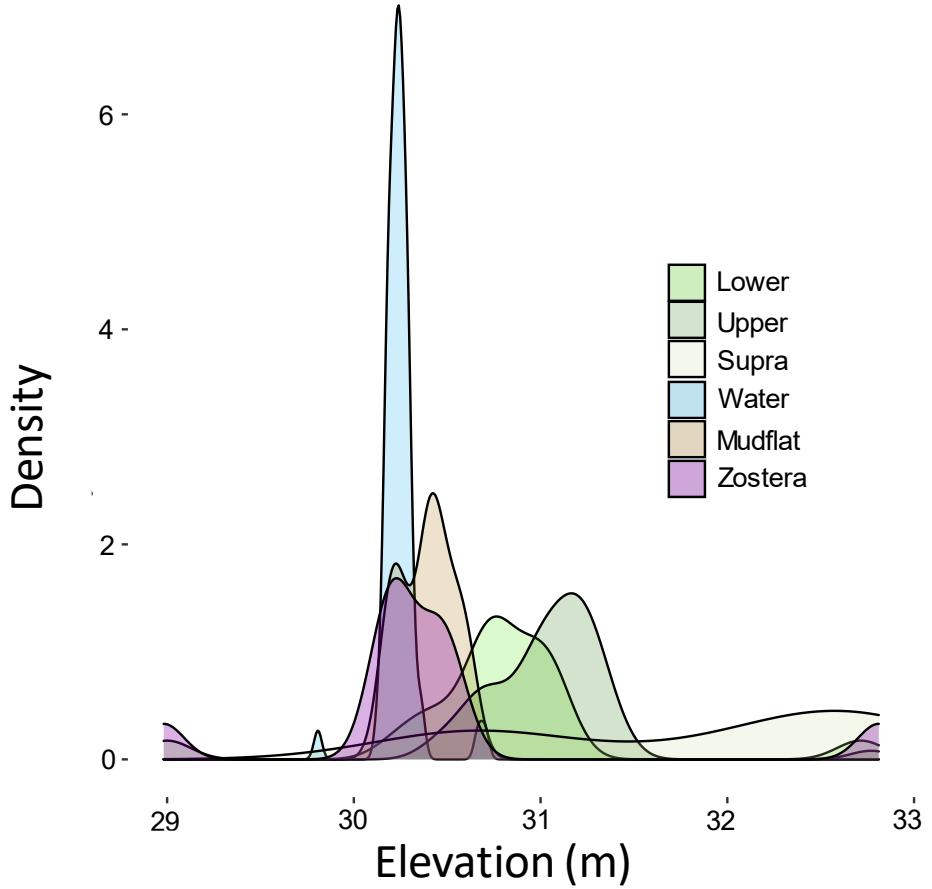
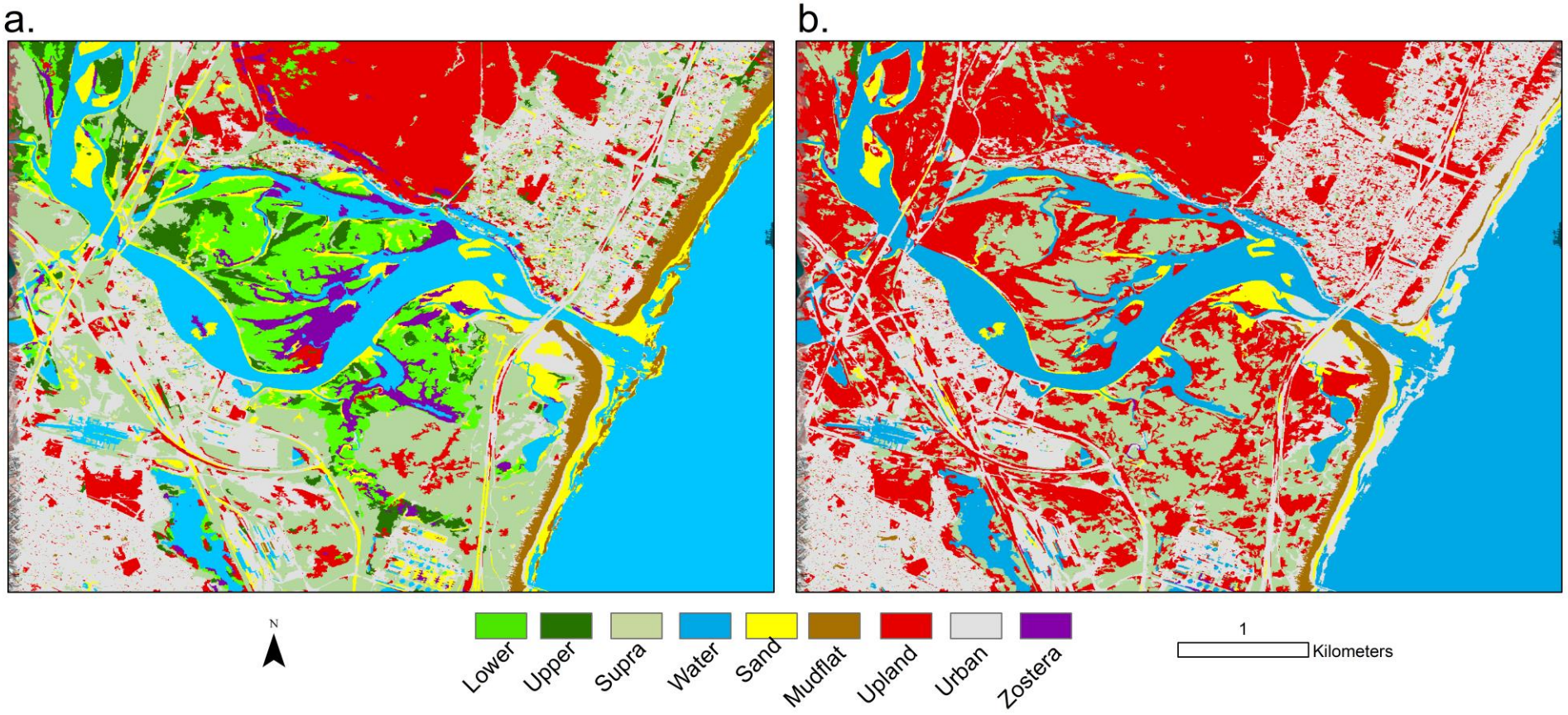




Adding SWIR data to the classification

- SWIR inclusion increased accuracy.
  - (a) SWIR model accuracy: 91.47.
  - (b) visible-NIR model: 90.5
- Elevation would likely further increase this accuracy



Takeaways

- VHR classifications performed well across the study sites
- SWIR bands improved the classification accuracy
- Tides are an important variable that will impact aerial campaign data
  - Minimize impact with spaceborne data to estimate the inundated intertidal extent